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Supersedes: D3.1B

Clark·Reliance®

LEVALARM® ALARMS AND CONTROLS

RELIABLE CONTROL OF ALARMS, FUEL CUT-OUTS, PUMPS

Install On Boilers, Tanks, Water Columns • Pressures To 1800 PSI

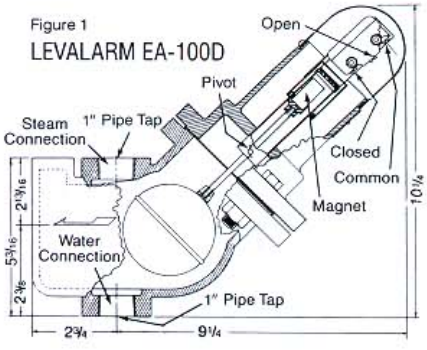
SERIES EA-100: SINGLE FUNCTION ON BOILERS OR TANKS (FIG. 3)

Actuate Electric Warning Signals Or Fuel Cut-Out. Pressures To 800 PSI At 520°F. (See Pg. D3.4C)

When tank or boiler levels reach predetermined high or low levels, the Levalarm will actuate bells, horns or lights. EA-100 models are also used for fuel cut-out control.

Operation (Fig. 1) A stainless steel float swings at the end of a pivot rod. The rod head carries an Alnico V magnet. The magnet attracts one leg of a U-shaped armature which is attached to a micro-switch leaf actuator. A buoyed float holds the switch open or closed, depending on terminals used. As liquid levels fall, the float drops and directs the magnet to the opposite position. A closed switch actuates alarms. An open switch achieves fuel cut-out.

Figure 1
LEVALARM EA-100D



Operation is highly reliable and sensitive because the magnet counterbalances the float, allowing accurate use of the float's buoyancy. Note that the magnet does not "slide," thereby eliminating any friction that could impede movement and accuracy.

For high temperature applications, a ventilated housing is available. Also, when insurance or other regulations require two independent fuel cut-outs, two Levalarms may be wired in series. (Or see EA-100*P Dual Function Levalarm.)

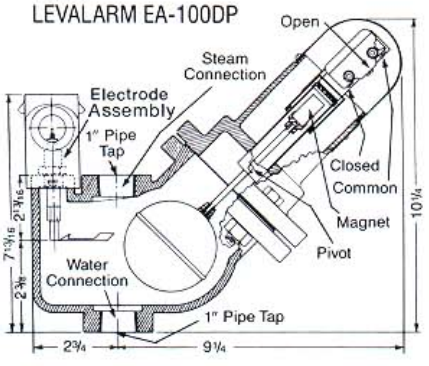
*(D or S)

MODEL EA-100P: DUAL FUNCTIONS ON BOILERS, TANKS & WATER COLUMNS (FIG. 4)

Actuate Dual Fuel Cut-Out, Fuel Cut-Out & Low Alarm, Or Dual Fuel Cut-Out & Low Alarm. Pressures To 800 PSI At 520°F. (See Pg. D3.4C)

These Levalarm models incorporate two independent controls, operating on different principles, and contained in a common body. They are usually installed when insurance or other regulations require two independent fuel cut-out devices – which may share a common chamber.

Figure 2
LEVALARM EA-100DP



One cut-out switch is float actuated, a second switch consists of one or two probes which extend into the water chamber, the chamber serving as a ground connection.

Probe Operation (Fig. 2) When water drops below the probe end, a relay is de-energized and opens the fuel cut-out circuit and/or closes the low alarm circuit. A second probe, shorter, can actuate an alarm when water **approaches** the fuel cut-out point.

Relay control units, in specified NEMA enclosures, can be mounted virtually any distance from the Levalarm.

Figure 3
EA-100D: SINGLE FUNCTION, FLOAT TYPE

Figure 4
EA-100DP: DUAL FUNCTION, FLOAT & PROBES

MODEL EA-100EPS: FOR EXPLOSION PROOF APPLICATIONS

Figure 5
MEETS UL® REQUIREMENTS

Levalarm Model EA-100EPS is equipped with a switch housing that meets UL requirements for Class 1, Group D, Division 1 service. In design, materials, and performance, this model is similar to Model EA-100S (see page D3.4C). Explosion proof models are ideally suited for chemical and petroleum field applications.

Figure 6
EA-101D: DUAL FUNCTION PROBE TYPE

Figure 7
EA-15R: DUAL FUNCTION, PROBE TYPE FOR FLOAT ALARM COLUMNS

SERIES EA-101: DUAL FUNCTIONS ON BOILERS AND TANKS

Recommended Control For Power Plants And Processing Facilities. Pressures To 1800 WSP. (See Pg. D3.4C)

Figure 8
COMPACT DESIGN, VERSATILE OPERATION

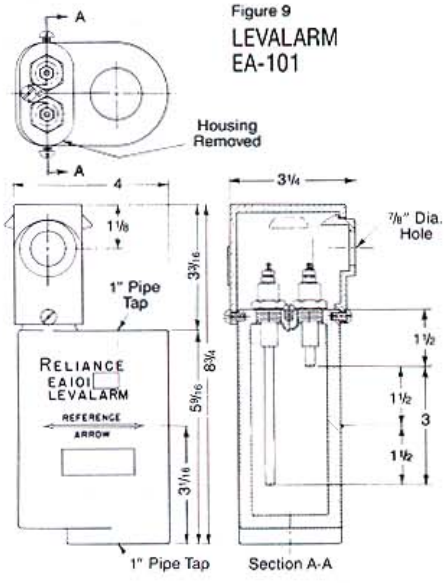


Figure 9
LEVALARM EA-101

Series EA-101 models provide reliable and instant response. Probes respond to the rise and fall of water at pre-determined points, to actuate a variety of controls. Each Levalarm monitors up to 3-inch level variation. Multiple units, in series, extend the monitoring range. Use almost anywhere on water applications.

Operation *One Probe/One Relay:* High Alarm – Low Alarm – Fuel Cut-Out (Low Alarm & Fuel Cut-Out At Same Level). *Two Probes/One Relay:* On And Off Pump Control Within 3-Inch Level Variation. *Two Probes/Two Relays:* Dual Fuel Cut-Out (Low Alarm & Fuel Cut-Out On Different Levels).

MODEL EA-15R: DUAL FUNCTIONS FOR FLOAT-TYPE WATER COLUMNS

For Fuel Cut-Out Only Or Fuel Cut-Out And Low Alarm. Pressures To 450 PSI. (See Pg. D3.4C)

Figure 10
MOUNTS TO WATER COLUMNS. 3/4" WATER GAGE VALVE CONNECTIONS

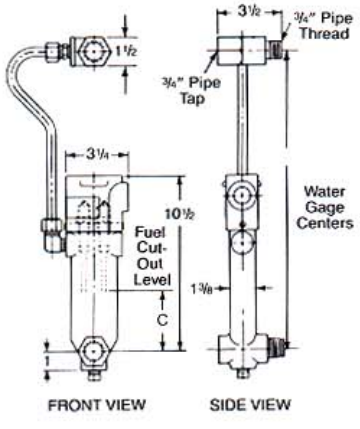


Figure 11
LEVALARM EA-15R

EA-15R is a probe type Levalarm featuring a pair of probes in a bronze body. Factory set cut-out levels may range from 2½" to 5½" above the lower water gage valve center. Minimum mounting centers: 12". When ordering, specify valve centers, and relay control unit. Also locate fuel cut-out point – distance above centerline of valve connection (C).

CLARK-RELIANCE RELAYS IMPROVE RELIABILITY, OFFER INSTALLATION EASE AND ECONOMY

- Each relay module is independently fuse protected.
- Plug-in relays are removed by hand, no tools required.
- Relays supply low voltage (12 VAC) to Probes.
- Relays enhance sensitivity for extremely low water-conductivity applications, to 1 MicroMho.
- Relays improve switch contact reliability for low load applications such as computer interface, recorders.
- Relays use integral LED indicators to verify status.
- Relays will retrofit existing system installations.

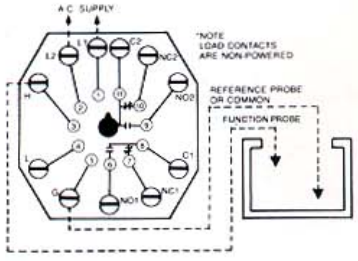


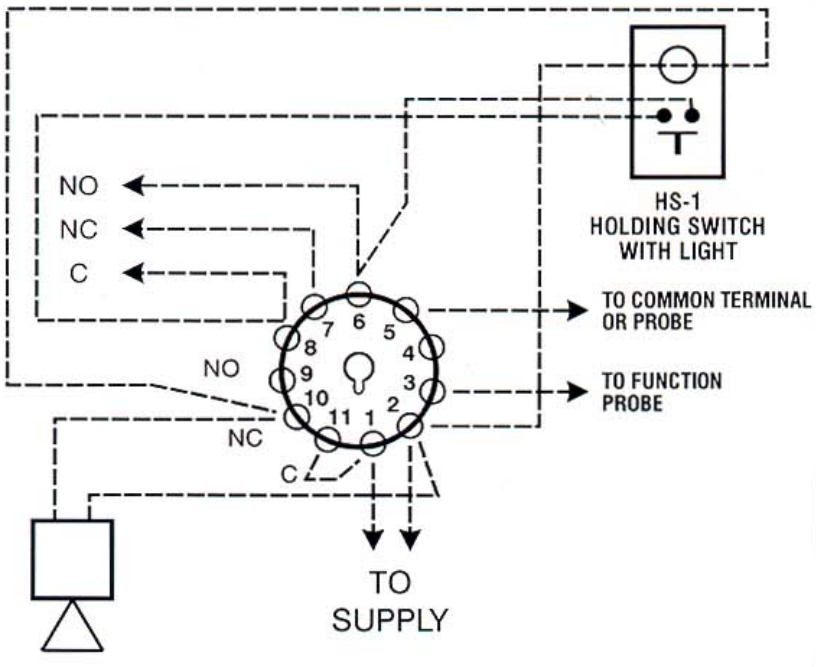
Figure 12
INTERWIRING DIAGRAM, CONTROL UNIT RELAY

Typical Relay, Single Level Service

Direct Mode Operation (Standard) When water level rises to Terminal 3 Probe, water completes circuit. Circuit signals Relay to change state of load contacts, activating Alarm or other equipment, while illuminating integral LED. Relay is energized until water drops below Probe to break circuit, turning off Alarm and LED.

Inverse Mode Operation (Optional) Upon powering Supply Terminals 1 and 2, Relay energizes (LED on). When water rises to Terminal 3 Probe, Probe signals Relay to de-energize (LED off). Relay remains de-energized until water drops below Probe. Even during momentary power failures, Relay remains in "safe" mode in Low Level applications. Specify inverse mode, when required.

Example Interwiring of Single Relay Control Unit with Optional Vibratory (350N) and Holding Switch (HS-1) for Low Level Service



This circuit is designed to activate the 350N Horn and the HS-1 Light, during a low level condition. The Holding Switch is designed to permit testing (blowdown), and bypasses the low level circuit.

Relay Control Unit Model Numbering Codes

R-240L

Relay Control Unit	Number of Relays	Control Unit Enclosure	Voltage	Low-Voltage, Plug-In Relay
		0 – Less Enclosure 1 – NEMA I Standard 4 – NEMA IV Weatherproof 7 – NEMA VII Explosionproof	0 – 120V 50/60Hz Primary A – 240V 50/60Hz Primary	

NOTE:

1. Standard units are furnished with relay part no. ECID-23R (Direct mode for 120VAC supply)
2. For optional inverse mode relays (Specify relay part no. ECID-26R for 120VAC supply)

Figure 13

FUEL CUT-OUT PROBE BYPASS

Figure 14
MODEL HS1 HOLDING SWITCH

During probe column or Levalarm blow-down, the Holding Switch provides a bypass around the fuel cut-out relay. This simple switch maintains relay circuit continuity momentarily, while being held in the bypass position during blowdown. The Holding Switch also provides an indicator light to verify that the fuel cut-out relay is functioning properly. The switch can be installed to operate with probe-type Levalarms on columns, boilers or tanks. Also available without indicator light (Model HSO).

AUDIBLE, VISUAL ALARMS

Figure 15
VIBRATORY HORN
Model 350N

Model LI-3 Model LI-2

Figure 16
VISUAL ALARMS

Audible or visual alarms are available for all Levalarm applications. The vibratory horn has a decibel rating of 100 DB at 10 ft. and comes in standard model (350N) or weatherproof model (350W). Visual alarms come in Normal/Danger and High/Normal/Low models. Specify supply voltage, when ordering.

Clark-Reliance "Retropak PC" Models EA-17 & 18 are available for converting float-type water columns into versatile Probe Control Stations. See Catalog 500, Section AB3.1.

CLARK-RELIANCE LEVALARM® MODELS: DESCRIPTIONS & FUNCTIONS

MODEL	REFERENCE	APPLICATION	FUNCTIONS	MATERIAL	CONNECTIONS	MAXIMUM PRESSURE	SWITCH RATING
EA-100D	Figure 1	Boilers & Tanks & Water Columns	High or Low Alarm, or Fuel Cut-Out	Cast Steel ASTM A216 Gr. WCB	1" Screwed	350 PSI	UL & CSA Approved SPDT 5A-125, 250, or 480V AC ½A-125V DC or ¼A-250V DC
EA-100S	— —				1" Screwed or 1" Socket-Weld	800 PSI @ 520°F	
EA-100 EPS Explosion Proof	— —				1" Screwed	800 PSI @ 520°F	
EA-101D	Figure 9		High or Low Alarm, Fuel Cut-Out & Pump Controls	Cast Steel ASTM A216 Gr. WCB	1" Screwed	350 WSP 1000 PSI	Series R100L (Plug-In) 5A-120 & 240V AC
EA-101S	— —				1" Screwed or 1" Socket-Weld	450 WSP 1000 PSI 1000 WSP 1800 PSI	
					1" Socket Weld	1800 WSP 1800 PSI	
EA-100DP	Figure 2		Dual Fuel Cut-Out or Fuel Cut-Out & Low Alarm or Dual Fuel Cut-Out & Low Water Level Alarm	Cast Steel ASTM A216 Gr. WCB	1" Screwed	350 WSP 650 PSI (Tank)	UL & CSA Approved SPDT 5A-125, 250, or 480V AC ½A-125V DC or ¼A-250V DC
EA-100SP	— —				1" Screwed or 1" Socket-Weld	800 PSI @ 520°F	
EA-15R	Figure 11			Bronze ASTM B61	¾" Screwed	450 WSP	Series R100L (Plug-In) 5A-120 & 240V AC
EA-17/EA-18 Retropak PC	Catalog Section AB3.1	Water Columns	High or Low Alarm, Fuel Cut-Out & Pump Controls	Carbon Steel ASTM A516	Flanged Cap	250 WSP Cast Iron 900 PSI Steel	

CLARK-RELIANCE LEVALARMS HAVE THE FOLLOWING APPROVALS:

FM
FACTORY MUTUAL

CSA
CANADIAN STANDARDS ASSOCIATION

Note: Specify CSA Requirement, when ordering.

For additional information, contact your local Clark-Reliance representative

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